

Amendments to the Claims:

This listing of claims will replace all prior versions, and listing of claims in the application.

1-94. (canceled)

95. (currently amended) A polynucleotide encoding a chimeric phosphorylation indicator having portions comprising a phosphorylatable domain and a fluorescent molecule, where the chimeric phosphorylation indicator comprises, in operative linkage, a donor molecule, a phosphorylatable domain, a phosphoaminoacid binding domain, and an acceptor molecule, at least one of said donor molecule and said acceptor molecule comprising a ~~non-oligomerizing~~ fluorescent molecule that has a reduced tendency to oligomerize compared with a corresponding naturally occurring fluorescent molecule,

wherein said donor molecule comprises ECFP (amino acids 1-227 of SEQ ID NO:6) or a substantially similar variant thereof having at least 80% amino acid sequence identity with ECFP (amino acids 1-227 of SEQ ID NO:6), said phosphorylatable domain comprises EEEAEYMNMAPQS (SEQ ID NO:23), said phosphoaminoacid binding domain comprises a Src homology domain-2, and said acceptor molecule comprises citrine (YFP; SEQ ID NO:10 having Q69M) or a substantially similar variant thereof having at least 80% amino acid sequence identity with citrine (YFP; SEQ ID NO: 10 having Q69M), wherein the amino acid following the initiating methionine is assigned the '1 position in the numbering of said donor and acceptor amino acid sequences,

wherein at least one of the donor molecule and the acceptor molecule comprises a mutation of an amino acid residue which corresponds to an A206K mutation, an L221K mutation, an F223R mutation, or an L221K and F223R mutation of SEQ ID NO:6 or SEQ ID NO:10.

96-108. (canceled)

109. (previously presented) The polynucleotide of claim 95, wherein the donor molecule and the acceptor molecule exhibit a detectable resonance energy transfer when the donor is excited.

110-114. (canceled)

115. (previously presented) The polynucleotide of claim 147, wherein the chimeric phosphorylation indicator further comprises a cell compartmentalization domain.

116. (previously presented) The polynucleotide of claim 115, wherein the cell compartmentalization domain is a membrane translocating domain.

117. (previously presented) The polynucleotide of claim 116, wherein the membrane translocating domain comprises an amino acid sequence CRQIKWFNRRMKWKK (SEQ ID NO:18).

118. (currently amended) The polynucleotide of claim 116, wherein the membrane translocating domain is operatively linked to the fluorescent protein through an amino acid sequence CCXXCC (SEQ ID NO:17) where X is any amino acid.

119. (previously presented) The polynucleotide of claim 95, wherein the donor and the acceptor molecule exhibit a detectable resonance energy transfer when the donor releases energy, and the detectable resonance energy transfer is fluorescence resonance energy transfer.

120. (canceled)

121. (previously presented) The polynucleotide of claim 147, wherein the phosphorylatable polypeptide comprises a serine/threonine kinase phosphorylatable domain.

122-124. (canceled)

125. (previously presented) The polynucleotide of claim 147, wherein the phosphorylatable polypeptide comprises a tyrosine kinase phosphorylatable domain.

126-127. (canceled)

128. (previously presented) The polynucleotide of claim 125 encoding a polypeptide comprising, in an orientation from the amino terminus to carboxy terminus, an ECFP (1-227) (amino acids 1 to 227 of SEQ ID NO:6) molecule, an SH2 phosphoaminoacid binding domain from Shc, a GSHSGSGKP (SEQ ED NO:22) linker, a phosphorylatable domain comprising EEEAEYMNMAPQS (SEQ ID NO:23), and citrine.

129. (canceled)

130. (previously presented) The polynucleotide of claim 95, wherein at least one amino acid of the phosphorylatable domain is phosphorylated.

131. (previously presented) The polynucleotide of claim 130, wherein the amino acid is serine, threonine, tyrosine, or a combination thereof.

132-144. (canceled)

145. (previously presented) The polynucleotide of claim 95, which is operatively linked to an expression control sequence.

146. (previously presented) The polynucleotide of claim 145, wherein the expression control sequence is a transcription regulatory element, a translation regulatory element, or a combination thereof.

147. (currently amended) A polynucleotide encoding a chimeric phosphorylation indicator having portions comprising a phosphorylatable polypeptide and a fluorescent protein which polynucleotide is operatively linked to an expression control sequence, wherein said fluorescent protein ~~comprises a non-oligomerizing~~

~~fluorescent protein having~~ has a reduced tendency to oligomerize compared with a corresponding naturally occurring fluorescent protein, and wherein said fluorescent protein comprises a green fluorescent protein (GFP) or a fluorescent protein related to a GFP and wherein said fluorescent protein comprises a mutation which corresponds to an A206K mutation, an L221K mutation, an F223R mutation, or an L221K and F223R mutation.

148. (currently amended) The polynucleotide of claim 147, wherein the expression control sequence is a transcription regulatory element, a translation regulatory element, or a combination thereof.

149. (previously presented) A kit comprising at least one polynucleotide of claim 95.

150. (previously presented) The kit of claim 149, comprising a plurality of polynucleotides encoding a plurality of chimeric phosphorylation indicators comprising at least two chimeric phosphorylation indicators differing from each other in at least one portion selected from the portions consisting of donor molecule, phosphorylatable domain, phosphoaminoacid binding domain, and acceptor molecule.

151. (previously presented) The kit of claim 150, wherein the chimeric phosphorylation indicators encoded by the polynucleotides comprise different phosphorylatable domains.

152. (previously presented) The kit of claim 150, wherein the chimeric phosphorylation indicators encoded by the polynucleotides comprise different donor molecules or acceptor molecules or both.

153. (previously presented) A kit comprising at least one polynucleotide of claim 147.

154. (currently amended) The kit of claim 153, comprising a plurality of polynucleotides encoding a plurality of chimeric phosphorylation indicators comprising at least two chimeric phosphorylation indicators differing from each other in at least one portion selected from the portions consisting of phosphorylatable polypeptide and ~~non-~~oligomerizing fluorescent protein.

155. (previously presented) The kit of claim 154, wherein the chimeric phosphorylation indicators encoded by the polynucleotides comprise different phosphorylatable polypeptides.

156. (currently amended) The kit of claim 154, wherein the chimeric phosphorylation indicators encoded by the polynucleotides comprise different ~~non-~~oligomerizing fluorescent proteins.

157. (currently amended) A kit comprising at least one polynucleotide of claim 147, which polynucleotide is operatively linked to an expression control sequence, wherein the chimeric phosphorylation indicator further comprises a phosphoamino acid binding domain operatively linked to the phosphorylatable polypeptide, wherein the ~~non-~~oligomerizing fluorescent protein comprises an N-terminal portion and a C-terminal portion, and wherein the phosphorylatable polypeptide and operatively linked phosphoaminoacid binding domain is operatively inserted between the N-terminal portion and C-terminal portion of the ~~non-~~oligomerizing fluorescent protein.

158. (currently amended) The kit of claim 157, comprising a plurality of chimeric phosphorylation indicators comprising at least two chimeric phosphorylation indicators differing from each other in at least one portion selected from the portions consisting of phosphorylatable polypeptide and ~~non-~~oligomerizing fluorescent protein.

159. (previously presented) The kit of claim 158, wherein the chimeric phosphorylation indicators comprise different phosphorylatable polypeptides.

160. (currently amended) The kit of claim 157, wherein the plurality of different chimeric phosphorylation indicators comprise different ~~non-oligomerizing~~ fluorescent proteins.

161. (previously presented) A vector comprising the polynucleotide of claim 95.

162. (previously presented) The vector of claim 161 which is an expression vector.

163-166. (canceled)